

**USDA
NATURAL RESOURCES
CONSERVATION SERVICE
MARYLAND
CONSERVATION
PRACTICE STANDARD**

FILTER STRIP

**CODE 393
(Reported by Acre)**

DEFINITION

A strip or area of herbaceous vegetation situated between cropland, grazing land, or disturbed land (including forestland), and environmentally sensitive areas.

PURPOSES

This practice may be applied for one or more of the following purposes:

1. To reduce sediment, particulate organic matter, sediment-adsorbed pollutants, and soluble pollutants in surface runoff;
2. To intercept nutrients in shallow groundwater;
3. To restore, create, or enhance wildlife habitat.

**CONDITIONS WHERE PRACTICE
APPLIES**

This practice may be applied in the following locations:

1. On the lower edges of cropland, grazing land, or disturbed areas where pollutants may move offsite into environmentally sensitive areas;
2. Up slope of conservation practices, such as ponds, diversions, and terraces, to reduce the amount of sediment or other contaminants moving into the practice area;
3. On land adjacent to water courses, water bodies, and wetlands, to provide riparian herbaceous buffers and wildlife habitat.

This practice does not apply to treatment of wastewater from milking parlors, silos, waste treatment lagoons, waste storage facilities, composting facilities, or below concentrated livestock holding areas. (Refer to the Maryland conservation practice standard for Wastewater Treatment Strip, Code 635.)

CONSIDERATIONS

Consider the long-term land use objectives of the client and how the implementation and maintenance of this practice will affect those objectives. Consider adjusting the size of the filter strip to accommodate harvesting and maintenance equipment.

Identify and evaluate any constraints such as management options, economic feasibility, access, state and federal regulations, or cost-share program requirements.

Assess site conditions, including surrounding land uses, types and quantity of pollutants, slopes and soils, residual herbicides (to the extent known), available moisture during the growing season, and existing vegetation on the site and in adjacent areas, including any noxious weeds that may be present.

Consider the potential for erosion where the filter strip will outlet into streams or channels.

Consider using this practice to protect areas with significant archaeological or cultural properties from potential damage from contaminants.

CRITERIA

Criteria Applicable to All Purposes

The filter strip shall consist of a perennial herbaceous planting that is not part of a cropland or pasture rotation. The location, layout, and density of the filter strip shall reflect the intended purpose of the practice, conditions of the site, and the objectives of the land user.

Site preparation and planting to establish the filter strip shall be done at a time and manner to insure survival and growth of the selected

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

species. A conservation tillage method shall be used for establishment when feasible.

Select plant species that are native to Maryland, or are introduced and are non-invasive (i.e., not likely to spread beyond the planted area and displace native species). Selection of native species shall be a priority when feasible.

The filter strip shall be protected from uncontrolled livestock access and frequent vehicular traffic. Noxious weeds shall be controlled as required by state law.

Note: Specific cost-sharing programs or other funding sources may impose criteria in addition to, or more restrictive than, those specified in this standard.

Additional Criteria to Reduce Sediment, Particulate Organic Matter, and/or Soluble Pollutants in Surface Runoff and Shallow Groundwater

These criteria apply to filter strips on the lower edges of cropland, grazing land, or disturbed areas where pollutants may move offsite via surface and/or subsurface flow into adjacent water courses, water bodies, wetlands, or other environmentally sensitive areas. These criteria also apply to filter strips installed up slope of conservation practices such as terraces or diversions.

Filter Strip Width (Flow Length) - In fields with slopes of 6 percent or less, the minimum filter strip width shall be 24 feet.

Table 1. Minimum filter strip widths by slope class.

Percent Slope	Minimum Strip Width (ft)
≤ 6	24
7	28
8	32
9	36
10	40

In fields with greater than 6 percent slopes, the minimum strip width shall be increased 4 feet for each one percent increase in slope perpendicular to the strip. Generally, the maximum effective length of flow is 100 feet for removal of sediment.

Sediment and Particulate Retention - Where the primary purpose of the filter strip is to trap sediment and other particulates in surface runoff, the slope of the land immediately above the filter strip shall be greater than 1% but less 10%. The filter strip shall be designed to convey surface water through vigorous dense vegetation. Overland flow entering the filter strip shall be primarily sheet flow. Concentrated flow shall be dispersed using level spreaders. The leading edge of the filter strip shall be approximately on the contour.

The ratio of drainage area to the filter strip area shall be less than 60:1 in regions with RUSLE-R factor values less than 175, and less than 50:1 in regions with RUSLE-R factor values of 175 or more.

Contributing land shall be treated so that the average annual sheet and rill erosion rate above the filter strip is less than 10 tons per acre per year. If the erosion rate is equal to or more than 10 tons per acre per year, or the slope of the land is steeper than 10%, consider using the conservation practice standard for Critical Area Planting, Code 342, to vegetate the slope.

Additional Criteria to Restore, Create, or Enhance Wildlife Habitat

When the filter strip is primarily intended to provide herbaceous buffer habitat between intensively used lands and riparian areas or other environmentally sensitive areas, the minimum width of the filter strip shall be 35 feet. Beyond this minimum, the width of the filter strip shall be based on the needs of the desired wildlife species for food, cover, and travel corridors. A diverse mixture of grasses, forbs, and/or legumes shall be selected and planted to benefit wildlife.

When wildlife habitat will be provided in combination with one or more other purposes, then the minimum criteria for the other purposes (e.g., sediment retention and nutrient uptake)

must also be met. If the filter strip width required by the other purpose(s) is less than 35 feet, then additional width shall be added for wildlife habitat, to achieve a minimum total width of 35 feet. Plantings shall be selected to provide wildlife benefits, provided that they do not detract from the filter strip's other functions.

When the primary purpose of the filter strip is to trap sediment and other particulates in surface runoff, any addition to the filter strip width specifically for wildlife habitat shall be added to the downhill edge of the filter strip where less sediment deposition is expected to occur.

Once established, the filter strip shall not be mowed during the nesting season of the desired wildlife species. For Maryland, the primary nesting season is generally from April 15 through August 15. Livestock and vehicular traffic shall likewise be excluded during the primary nesting season.

SPECIFICATIONS

All trees, stumps, rocks or similar materials that will interfere with installing the grass filter strip shall be removed. The materials shall be disposed of in a manner consistent with maintaining a quality environment and with proper functioning of the filter strip.

Plans and specifications for filter strips shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. The completed work shall be checked and documented to verify that this practice was completed according to the drawings, specifications, and this standard. Documentation shall be in accordance with the section "Supporting Data and Documentation" in this standard.

Selection of Plant Species

For most sites and intended uses of the filter strip, seeding mixes shall be specified in accordance with the conservation practice standard for Critical Area Planting, Code 342. Code 342 is best suited when severe site conditions are present or anticipated, and significant erosion control and sediment retention is needed.

When site conditions are not severe, and optimum wildlife habitat is desired, the conservation practice standard for Conservation Cover, Code 327, shall be used to specify the appropriate seeding mix.

Proper Treatment of Plant Materials

All plant materials must be correctly handled before planting. In general, plants shall be planted as soon as possible after receiving them from the supplier. Seed shall be kept cool and dry until planted.

Recommended Planting Dates

Refer to the conservation practice standards for Critical Area Planting, Code 342, or Conservation Cover, Code 327, as appropriate, to determine the recommended planting dates for the different types of plant materials.

Establishment of Plant Materials

Follow the establishment recommendations provided in the Maryland Job Sheets for warm season grass plantings and cool season grass plantings. The completed Job Sheet(s) can serve as the planting plan and specifications for the practice.

OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan shall be prepared for each filter strip. Appropriate Job Sheet(s) may be used to serve as the management plan as well as supporting documentation, and shall be provided to the land user. At a minimum, the following components shall be addressed in the O&M plan, as applicable:

Vegetation in the Filter Strip

Vegetation must be maintained in a vigorous condition. For optimum sediment retention and other water quality benefits, mow two to three times annually to a height of 3 to 5 inches, and remove top growth if possible. Removal of top growth from the site can significantly reduce the amount of nitrate-nitrogen in the soil, and can reduce the movement of nitrate-nitrogen below the root zone. If phosphorus is a concern, periodically test the soil to monitor phosphorus build-up.

Where wildlife habitat is a concern, mow only the minimum area necessary to filter sediment (see Table 1 for minimum widths), and do not mow during the primary nesting season (April 15 to August 15).

When tilling adjacent fields, care must be taken to not plow into the filter strip and decrease the width, or to create furrows adjacent and parallel to the filter strip that can turn into gullies.

Maintain fencing as needed to protect the filter strip from uncontrolled access.

Control undesirable plants by pulling, mowing, or spraying with a selective herbicide. Control noxious weeds as required by state law.

Inspect for insects and diseases, and if an incidence threatens stand survival, take corrective action to bring the pest under control.

Sheet Flow

Maintain sheet flow entering the filter strip. Repair all rills and small channels within the filter strip. Needed repairs must be made immediately to reestablish sheet flow onto and through the filter strip.

Sediment Accumulation

Sediment that accumulates along the upper part and within the filter strip shall be removed before it accumulates to a height of 6 inches and begins to divert runoff water around the filter strip as concentrated flow. Removal and redistribution can be accomplished with tillage equipment or other machinery. The area disturbed by this removal shall be regraded and replanted if necessary.

Acceptable Uses

Describe the acceptable uses (e.g., flash grazing, haying, etc.) and time of year/frequency of use restrictions, if any. Pay particular attention to cost-sharing program requirements as they relate to acceptable vs. restricted uses, and other management restrictions.

Frequency of Inspections

Inspect the filter strip at least once per year.

SUPPORTING DATA AND DOCUMENTATION

1. Field location and extent of planting in acres, and assistance notes. Also note the location of the planting on the conservation plan map. Assistance notes shall include dates of site inspections, name or initials of the person who made the inspections, specifics as to what was inspected, alternatives discussed, decisions made, and by whom.
2. Soil type.
3. Species selected for establishment, seeding/planting rates, and planting dates.
4. Design slope, width and length of the filter strip.
5. Operation and Maintenance plan, or job sheet.

REFERENCES

1. USDA, Natural Resources Conservation Service. *Conservation Practice Standard for Conservation Cover, Code 327*. Maryland Field Office Technical Guide, Section IV.
2. USDA, Natural Resources Conservation Service. *Conservation Practice Standard for Critical Area Planting, Code 342*. Maryland Field Office Technical Guide, Section IV.
3. USDA, Natural Resources Conservation Service. *Conservation Practice Standard for Riparian Forest Buffer, Code 391*. Maryland Field Office Technical Guide, Section IV.
4. USDA, Natural Resources Conservation Service. *Conservation Practice Standard for Wastewater Treatment Strip, Code 635*. Maryland Field Office Technical Guide, Section IV.
5. USDA, Natural Resources Conservation Service, September 1995. *Nutrient and Sediment Control System for the Treatment of Cropland Runoff*. Water Quality Technical Note, NNTC, Chester, PA.
6. USDA, Soil Conservation Service, 1991. *A Procedure for the Design of Vegetative Filter Strips, Final Report*.